

Only the german version of the module description as part of the study regulations is legally binding.

Module name	Biomedical Engineering - Technical Specialization
Module number	INF-25-Ma-NSP-BMT
Responsible lecturer	Prof. Dr. Hagen Malberg hagen.malberg@tu-dresden.de
Qualification objectives	Students have the knowledge, skills and abilities to develop medical device technology and IT-supported analysis of physiological signals. They have basic knowledge of regulatory requirements along the life cycle of medical devices. They can independently solve tasks in the application and development of diagnostic and therapeutic technology in the evaluation process and are familiar with the functional principles and methodological tools for the development of such systems.
Content	The module covers the basic principles of medical measurement and sensor technology, therapeutic systems technology, in particular electromedical systems, detoxification, infusion technology and cardioassistance systems etc. Further contents of the module are medical questions and problems and technical solutions in the form of medical devices as well as selected organ systems, such as cardiovascular system, urinary system, respiratory system and nervous and muscular system. The module also covers regulatory affairs, in particular basic legal requirements such as the Medical Device Regulation (MDR) and normative requirements for the development process of medical devices and their manufacture and monitoring, such as special biosignal processing, in particular the medical signal processing chain, artifact handling and principal component analysis, biosignal analysis in the time domain, biosignal analysis with non-linear and knowledge-based methods, medical statistics and study planning as well as the application of artificial intelligence in biomedical engineering, in particular knowledge-based systems and artificial neural networks.
Teaching and learning methods	The module comprises lectures of 5 SWS, seminars of 3 SWS and the self-study. The language of instruction for lectures and seminars is German.
Prerequisites for participation	In the Diploma degree program in Computer Science, the competencies to be acquired in the modules INF-25-Ma-NGR-BMT Biomedical Engineering Fundamentals and INF-25-Ma-NVE-BMT Biomedical Engineering - Clinical Specialization are a prerequisite.
Applicability	The module is a compulsory module of the non-computer science supplement Biomedical Technical. The module creates the prerequisites for the modules listed under prerequisites for participation.
Requirements for earning credit points	The credit points are earned if the module examination is passed. The module examination consists of a written examination lasting 90 minutes and a complex examination lasting 40 hours. Both examinations are relevant for passing the module. The examination language for the

	written examination and the complex assignment is German.
Credit points and grades	12 credit points can be earned through the module. The module grade is calculated from the un weighted average of the grades of the individual examinations.
Module frequency	The module is offered every winter semester.
Workload	The total workload is 360 hours.
Module duration	The module comprises one semester.